

## ELID Grinding of Large Aspheric Optics, Phase I

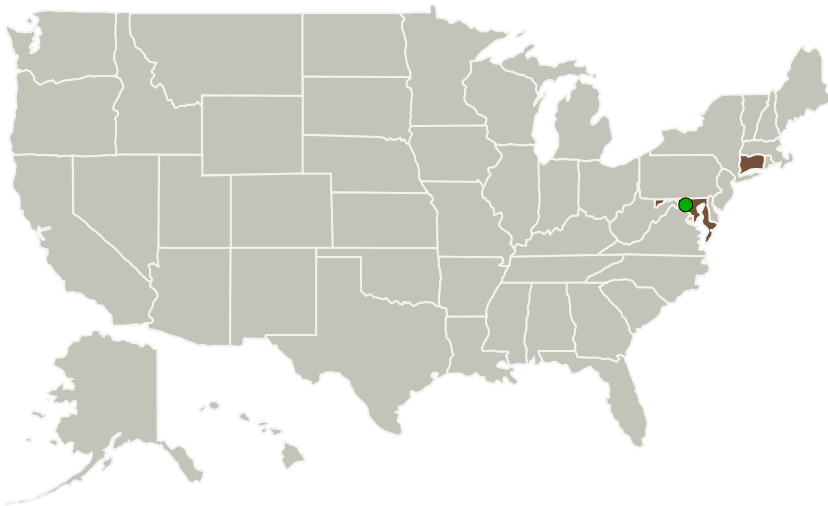
Completed Technology Project (2011 - 2011)



## Project Introduction

Large aperture aspheric optics are among the most susceptible optical surfaces to the accumulation of periodic surface artifacts during fabrication. Periodic features are created during the manufacturing process and lead to significant degradation in imaging performance. Most research on the topic addresses polishing, and in particular smoothing of periodic features. Our proposal addresses preventing such surface artifacts during the generating and grinding processes. Prevention upstream in the process can lead to significant cost reductions and simplification of downstream polishing processes. The Phase-1 effort will study of how the introduction of an ELID in-situ tool dressing technique can prevent or minimize the creation of mid and high spatial frequency surface features in the process of fabricating glass and Silicon Carbide aspheric optics and replication mandrels. We propose to construct and test an experimental platform that allows us to characterize the benefits and tune the process. We expect the result of this work to prepare the way to apply this technology to meter-class optical mirrors and replication mandrels as part of a Phase-II effort and will contribute to a strategy of cost reductions necessary for insertion of segmented aspheric and glancing incidence optics in future telescope missions.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Flemming Tinker Inc.	Lead Organization	Industry	Higganum, Connecticut
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Connecticut	Maryland

## Project Transitions

**February 2011:** Project Start**September 2011:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138125>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Flemming Tinker Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

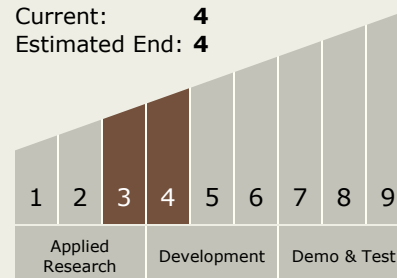
**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Kai Xin

## Technology Maturity (TRL)

Start: **3**Current: **4**Estimated End: **4**

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### Technology Areas

#### Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.4 Manufacturing
    - └ TX12.4.3 Electronics and Optics Manufacturing Process

### Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System